

REMARKS

In response to the above-identified Office Action, Applicants amend the application and seek reconsideration thereof. In this response, Applicants amend claims 1, 3-4, 6 and 10, and cancel claims 2 and 5. Applicants do not add any new claims. Accordingly, claims 1, 3-4 and 6-10 are pending.

I. Claims Rejected Under 35 U.S.C. §112

The Examiner rejects claims 1-10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states “the scope of alkyl groups and aryl groups substituted by alkyl groups containing one or more atoms selected from the group consisting of O, N, S, Si and Ge is not clear.” Paper No. 5, page 2. Applicants have amended claims 1 and 4 to clarify the claims.

Amended claims 1 and 4 each recite a formula wherein R_1 and R_2 are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R_1 and R_2 is a polar group containing an ether bond. Therefore, Applicants respectfully submit claims 1 and 4 particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1 and 4.

Regarding the scope of R_1 and R_2 in claims 3 and 6, Applicants have amended independent claims 1 and 4 and respectfully submit dependent claims 3 and 6 clearly define a compound and electroluminescence (EL) polymer, respectively. Representatively, a straight-chain alkyl group having two oxygen atoms has a structure $-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_3$.

Regarding the interpretation of claim 4, the Examiner states “n” is not explicitly defined for the formula set forth. Applicants have deleted “n” in claim 4. Therefore, Applicants respectfully submit claim 4 clearly defines an EL polymer. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 4.

Applicants have canceled claim 5. Claims 6-10 depend from claim 4 and contain all of the elements thereof. Therefore, Applicants respectfully submit claims 6-10 clearly define an EL polymer. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 6-10.

II. Claims Rejected Under 35 U.S.C. §102(b)

The Examiner rejects claims 1, 4 and 10 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,621,121 issued to Kreuder, et al. ("Kreuder").

To anticipate a claim, the relied upon reference must disclose every limitation of the claim. Among other limitations, amended independent Claim 1 defines a spirobifluorene compound wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R₁ and R₂ is a polar group containing an ether bond. Applicants respectfully submit Kreuder fails to teach at least these elements of claim 1.

In making the rejection, the Examiner characterizes Kreuder as showing an aryl group substituted by C₁₋₂₂ alkyl and containing one or more atoms selected from the group consisting of O, N, S, Si and Ge. See Paper No. 5, pages 3-4. Applicants note that amended claim 1 incorporates the elements of claim 2. The Examiner does not cite Kreuder as teaching the elements of claim 2 and, in particular, at least one of R₁ and R₂ being a polar group containing an ether bond. Moreover, in reviewing Kreuder, Applicants have been unable to discern any sections of Kreuder that teach at least one of R₁ and R₂ being a polar group containing an ether bond. Therefore, Kreuder fails to teach each of the elements of claim 1.

The failure of Kreuder to teach each of the elements of claim 1 is fatal to the rejection. Therefore, claim 1 is not anticipated by Kreuder. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1.

Regarding the rejection of claim 4, among other elements, claim 4 defines an EL polymer wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R₁ and R₂ is a polar group containing an ether bond similar to claim 1. Therefore, Applicants respectfully submit the

discussion above regarding Kreuder failing to anticipate claim 1 is equally applicable to claim 4 since Kreuder fails to teach at least one of R₁ and R₂ being a polar group containing an ether bond. Thus, Kreuder fails to teach each of the elements of claim 4.

The failure of Kreuder to teach each of the elements of claim 4 is fatal to the rejection. Therefore, claim 4 is not anticipated by Kreuder. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 4.

Claim 10 depends from claim 4 and contains all of the elements thereof. Therefore, claim 10 is not anticipated by Kreuder at least for the same reasons as claim 4. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 10.

III. Claims Rejected Under 35 U.S.C. §103(a)

The Examiner rejects claims 7, 8 and 10 under 35 U.S.C. 103(a) as being obvious over Kreuder. Applicants amend claim 4.

To establish a *prima facie* case of obviousness, the prior art must teach or suggest all of the claim limitations. See MPEP § 2143.03; see also In re Royka, 490 F.2d 981; 180 USPQ 580 (CCPA 1974). Claims 7, 8 and 10 each depend from independent claim 4 and contain all of the elements thereof. Therefore, the discussion regarding the rejection of claims 7, 8 and 10 will be addressed in terms of claim 4 since Applicants believe Kreuder in view of the ordinary skill in the art at the time of the invention does not render independent claim 4 obvious and claims 7, 8 and 10 contain all of the elements of claim 4.

Regarding claim 4, among other elements, claim 4 defines an EL polymer wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R₁ and R₂ is a polar group containing an ether bond. In making the rejection, the Examiner characterizes Kreuder as showing an aryl group substituted by C₁₋₂₂ alkyl and containing one or more atoms selected from the group consisting of O, N, S, Si and Ge. See Paper No. 5, page 4.

Amended claim 4 incorporates the elements of claim 5, in particular, at least one of R₁ and R₂ being a polar group containing an ether bond. The Examiner does not cite Kreuder as teaching

the elements of at least one of R₁ and R₂ being a polar group containing an ether bond contained in claim 5. Moreover, in reviewing Kreuder, Applicants are unable to discern any sections of Kreuder that teach or suggest at least one of R₁ and R₂ being a polar group containing an ether. Therefore, Kreuder fails to teach or suggest each of the elements of claim 4.

In addition, Applicants respectfully submit that one of ordinary skill in the art at the time of the invention would not have had the proper motivation to modify Kreuder to read on each of the elements of claim 4 since Kreuder teaches polymer structures not structurally close enough to be modified into a polar group containing an ether. Therefore, Kreuder in view of the skill of one of ordinary skill in the art fails to teach or suggest each of the elements of claim 4.

Claims 7, 8 and 10 depend from claim 4 and contain all of the limitations thereof. Therefore, since Kreuder in view of the ordinary skill in the art fails to teach or suggest each of the elements of claim 4, the prior art fails to teach or suggest at least these elements of claims 7, 8 and 10. Thus, the prior art fails to teach or suggest each of the elements of claims 7, 8 and 10. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 7, 8 and 10.

IV. Claims Rejected Under 35 U.S.C. §103(a)

The Examiner rejects claims 1-9 under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,132,641 issued to Reitz et. al ("Reitz"). Applicants have canceled claims 2 and 5, but have amended claims 1 and 4 to include the limitations of claims 2 and 5, respectively. Applicants traverse the rejection of claims 1, 3-4 and 6-9.

To establish a *prima facie* case of obviousness, the prior art must teach or suggest all of the claim limitations. See MPEP § 2143.03; see also In re Royka, 490 F.2d 981; 180 USPQ 580 (CCPA 1974). Among other elements, amended claim 1 defines a spirobifluorene compound shown in the figure included in claim 1 wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R₁ and R₂ is a polar group containing an ether bond. Applicants respectfully submit Reitz in view of the ordinary skill in the art at the time of the invention does not render independent claim 1 obvious.

In making the rejection, the Examiner characterizes Reitz as showing “fluorescent polymers of spirobifluorene for use as a light emitting material in an electroluminescence element having the structure of a layer comprising the polymer interposed between a pair of electrodes.” Paper No. 5, page 5. The Examiner asserts it would have been obvious to one skilled in the art to provide the R groups of Reitz at different positions on the spirobisfluorene structure to read on claims 1-9. See Paper No. 5, pages 6-7. However, in making this assertion, the Examiner does not point to any reference to be combined with Reitz to support the Examiner’s position. Applicants respectfully traverse the Examiner’s assertion regarding the ordinary skill in the art at the time of the invention and request the Examiner to provide Applicant with a prior art reference which the Examiner believes can be combined with Reitz to teach or suggest each of the elements of claim 1. In addition, Applicants respectfully submit that one of ordinary skill in the art at the time of the invention would not have had the proper motivation to modify Reitz to read on each of the elements of claim 1.

Claim 1 recites a spirobifluorene compound shown in the figure included in claim 1 wherein R_1 and R_2 are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms, and at least one of the R_1 and R_2 is a polar group containing an ether bond. The spirobifluorene compound defined in claim 1 has benzene rings directly linked beside each other. In contrast, Reitz teaches compounds with two benzene rings in a spirofluorene structure diagonally linked through a central carbon of the spiro structure. Therefore, Reitz fails to teach or suggest each of the elements of claim 1.

In addition, Applicants respectfully submit that one skilled in the art would not have had the proper motivation to modify the benzene rings diagonally linked through a central carbon of Reitz to read on claim 1 since the Examiner has not shown given one structure it would be obvious to make the structure of claim 1, particularly without a showing that aryl structures generally share common synthesis routes. Therefore, Reitz in view of the ordinary skill in the art at the time of the invention fails to teach or suggest each of the elements of claim 1.

The failure of the prior art to teach or suggest each of the elements of claim 1 is fatal to the obviousness rejection. Therefore, claim 1 is not obvious over the prior art. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1.

Claim 3 depends from claim 1 and contains all of the limitations thereof. Therefore, claim 3 is not obvious over the prior art at least for the same reasons as claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 3.

Regarding the rejection of claim 4, among other elements, claim 4 defines an EL polymer including repeated compounds with structures similar to the compound in claim 1. Therefore, Applicants respectfully submit the discussion above regarding the prior art failing to teach or suggest each of the elements of claim 1 is equally applicable to claim 4 since claim 4 defines a polymer including compounds similar to claim 1.

In addition, the polymer in claim 4 has benzene rings directly linked beside each other in a spirofluorene structure forming a polyphenylene type conjugated polymer in which the benzene rings are linearly and continuously linked. In contrast, the structures in Reitz are not a conjugated polymer similar to claim 4 since the two benzene rings in a spirofluorene structure are diagonally linked through a central carbon of a spiro structure. Therefore, Reitz in view of the prior art fails to teach or suggest each of the elements of claim 4.

The failure of the prior art to teach or suggest each of the elements of claim 4 is fatal to the obviousness rejection. Therefore, claim 4 is not obvious over the prior art. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 4.

Claims 6-9 depend from claim 4 and contain all of the limitations thereof. Therefore, claims 6-9 are not obvious over the prior art at least for the same reasons as claim 4. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 6-9.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending (1) are in proper form, (2) are neither obvious nor anticipated by the relied upon art of record, and (3) are in condition for allowance. A Notice of Allowance is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope with sufficient postage addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on October 27, 2003.


Nadya Gordon

10/27/03
Date